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ABSTRACT

The organization of knowledge has been identified as a crucial element for the facilitation of learning based on theories of teaching for understanding, information processing, schemata development, and constructivism. This study reports on the validation of a teaching and learning tool through an investigation in which 44 college students attempted to list the names of 21 psychological theories and 52 conceptual terms covered in a psychology course on a grid chart that included these psychological viewpoints: psychoanalytic, behavioristic, humanistic, and cognitive. Correct answers for the names of theorists and concepts under the proper headings were positively related to class examination performance at statistically significant levels. Error scores were not found to be statistically significant in relation to class achievement. The results support the belief that students who correctly organized psychological knowledge tended to be more likely to achieve success in the course. Three appendixes contain the list of theorists and concepts and the learning task grid sheet and answer key. (Contains 1 table and 13 references.) (SLD)

Student Organization of Psychological Content

As a Predictor of College Classroom Success

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Running head: Organized Knowledge

Abstract

The organization of knowledge has been identified as a crucial element for the facilitation of learning based upon theories of teaching for understanding, information processing, schemata development, and constructivism. This study reports on the validation of a teaching and learning tool where students attempted to accurately list the names of 21 psychological theorists and 52 conceptual terms covered in a psychology course on a grid chart that included the following viewpoints in psychology: psychoanalytic, behavioristic, humanistic, and cognitive. Correct answers for the names of theorists and concepts under the proper headings were positively related at statistically significant levels to class exam performance. Error scores were not found to be statistically significantly related to class achievement. The results support the belief that students who correctly organized psychological knowledge tended to be more likely to achieve success in the course.

Student Organization of Psychological Content As a Predictor of College Classroom Success

As more and more college and university professors develop a keen interest in teaching excellence and student outcomes as a measure of success, the focus quite naturally has turned to how students learn specific content and use knowledge to solve problems. The identification of appropriate subject matter to be taught in a course is an essential ingredient in planning for effective instruction. However, it isn't long before pedagogical issues such as "scope and sequence" force educators to think about how course content will be structured and sequentially organized and consider what tools might optimize such teaching and learning.

It is logical to expect that many teachers of psychology who often possess a rich knowledge base in learning theory, motivation, transfer of knowledge, conceptual understanding, memory, and intelligence would employ their psychological knowledge in order to advance pedagogy and improve how students learn psychology. At the most fundamental level, this is using psychology to advance the teaching of psychology. Such a worthwhile goal would seem to be a great challenge to the field.

The organization of knowledge is an essential feature of several theoretical traditions that attempt to promote learning, remembering, and

intellectual development. Since space limits the in-depth exploration of all such related theoretical views, only a brief overview of several prominent perspectives and some research findings that reflect the importance of the organization of knowledge will be presented here.

A broad approach to thinking about the value of knowledge organization might be to consider the idea of "pedagogical content knowledge" (PCK) where emphasis is placed upon an understanding of how to teach specific subject matter to particular students (Shulman, 1987). Teaching excellence according to this view is dependent upon a pedagogical awareness of the structural elements of the content, process, and outcome components as well as contextual elements such as the learning environment and student readiness to learn.

The constructivist approach to teaching and learning also suggests that that the organizational structure of knowledge and the relationships between facts, ideas, and theories might lead to academic excellence. Saunders (1992) described constructivism as "the notion that learners respond to their sensory experiences by building or constructing in their minds, schemas or cognitive structures which constitute the meaning and understanding of their world" (p. 136).

If students construct their own knowledge within a social educational setting, isn't it likely that errors might occur during the construction of

knowledge? Garnett, Garnett, and Hackling (1995) reported problems of misconceptions or misconstructions amongst chemistry students as inhibitors to learning. Ormrod (2000) provided examples of some common student misconceptions in astronomy, biology, physics, geography, and psychology. An example from psychology included the fact that many students **inaccurately** believe that negative reinforcement is "the presentation of an aversive stimulus (e.g., a scolding, a spanking). Its effect, if any, is to decrease the frequency of a behavior that it follows. Essentially, the term is just a nicer way of saying 'punishment'" (p. 280).

Bruner (1960) suggested that the structure of knowledge included the fundamental ideas, relationships, and patterns of subject matter. Bruner suggested that such structure is crucial for learning because:

- Fundamental ideas make the subject more comprehensible.
- Unorganized information is rapidly forgotten.
- Understanding of fundamental principles and ideas appears to be necessary for adequate transfer.
- Structure allows the person to narrow the gap between elementary and advanced knowledge.

The information-processing model highlights the importance of subject matter organization for encoding, processing, and retrieval. Bower, Clark, Lesgold, & Winzenz (1969) demonstrated the learning benefits of organizing

words in structured lists over the random arrangement of words within a hierarchical tree arrangement. Not only were the benefits of chunking observed, but also word items seemed to also serve as cues for related items.

The use of advance organizers to introduce, frame, and structure class content for learners and teachers has been the focus of considerable research interest (Ausubel, 1978; Corkill, 1992). Bruning, Schraw, and Ronning (1999) suggested that the successful use of advance organizers included the conditions of clarity, concreteness, familiarity, and frequency of use as a reference during a lesson.

Organized bodies of knowledge normally include facts, concepts, generalizations, and principles, as well as relationships among such ideas and such structure has been employed to help students understand complex fields (Calfee, 1986; Rosenshine, 1986). Content organization has been described as "the process of clustering related items of content into categories or patterns that illustrate relationships" (Egan & Kauchak, 2001, p. 274).

The current study was designed as an attempt to validate a teaching and learning tool already existing in the literature (Herman, 1998). The device employed a grid system where students organize prominent theorists and concepts according to four major psychological viewpoints. It was predicted that the accurate listing of the names of theorists, terms, and concepts under

appropriate viewpoint headings would indicate a more sophisticated structure of knowledge and is related to higher college classroom achievement.

Method

Subjects (n=44) were student volunteers in an undergraduate educational psychology course at a small state university campus in New York State. The course instructor employed the four viewpoints in psychology approach as one of several content organizational techniques in the course (see Herman, 1998). Near the end of the semester, students were given a list of 21 theorists and 52 conceptual terms covered in the course. Students worked independently to place each name or concept under only one heading (a forced-choice task) on a grid depicting the following four points of view in psychology: psychoanalytic, behavioristic, humanistic, and cognitive. See Appendix A, B, and C for the data collection devices that also served as a classroom learning tool.

After students turned in their grid of psychological knowledge, they were given the answers (see Appendix C). The items correctly and incorrectly positioned under headings on the grid were tallied for each student in the class. This scoring procedure yielded grid achievement scores (items correctly listed) and error scores (items incorrectly listed in theorist and concept categories).

Academic achievement in the course was measured by the total cumulative points (275 possible) earned at the point in the semester when the grid learning tool was employed. The majority of points earned were derived

from 3 multiple-choice tests (225 questions) where most items were written to tap knowledge well above the simple recall of factual knowledge. An essay exam (50 points) constituted the remainder of the point total for class achievement.

Results

Grid achievement scores for correct answers were both found to be statistically significant predictors of overall class performance (theorists: $r=+.33^{*}$, $p < .05$ and concepts: $r=+.66^{**}$, $p < .01$). Error scores were found to be substantially weaker predictors and not statistically significant (theorists: $r=-.18$, $p > .05$ and concepts: $r=-.01$, $p > .05$). Combinatorial grid scale scores of independent variables were not able to improve the prediction of class achievement beyond the correct answers for terms and concepts ($r=+.66^{**}$).

Table 1 offers several common errors that were detected such as labeling: Erik Erikson as a cognitive or humanistic psychologist rather than as a psychoanalyst and listing the concept of a defense mechanism as a behavioristic term rather than as a psychoanalytic concept. Such findings offered valuable clues to the misconstruction of knowledge, but also uncovered some ambiguity in the forced-choice nature of placing names and concepts in only one category without considering the plausibility of other options.

Discussion

The results offer empirical support for the use of teaching and learning tools such as the one outlined here and in previous work (see Herman, 1998). Such teaching and learning devices seem to be effective and efficient, due to the fact that psychology students are often presented with a vast amount of information in a relatively brief period of time and asked to apply such knowledge to understand behavioral problems. It would seem that the organization of psychological knowledge is crucial to academic success and the transfer of psychological knowledge to practical situations.

The fact that error scores were not found to be powerful predictors of overall class performance deserves careful examination and further elaboration. Readers need to understand that this grid learning/teaching tool was used in the 13th week of the 15-week semester. This means that the weaker predictive power of error scores might be explained by forgetting or confusing course material over time or correcting errors on later exams immediately prior to the use of the instructional tool in class. Future research will need to explain why error scores appear to be weaker predictors of overall class performance or even if this is always the case.

One major limitation of this naturalistic study was an ethical issue related to how to study the effectiveness of the grid learning tool in the classroom. It was deemed unethical to withhold from students a classroom learning tool that was suspected of being able to help students perform at their

highest level on classroom exams simply to collect data that support the research hypothesis. Since correlational research does not answer the important question of cause and effect, it is **not** possible to infer that responses to the grid task directly resulted in improved course performance. Many other variables are involved in learning course content and performing on class examinations. It is also difficult to determine exactly when students had organized this knowledge (e.g., prior to the class, early in the semester). Only future research that explores this grid learning tool as a treatment or intervention technique will begin to answer some of these important questions.

The common student misconceptions or misunderstandings listed in Table 1 offer valuable insights for teachers of psychology. The obvious errors that students made became discussion items in class and additional handouts were designed to clarify these points of confusion. The remaining items were more difficult to deal with, since there appeared to be from the start some legitimate justification for what was initially designated as an "error." Students were placed in focus groups and told to discuss the findings from Table 1 with the ideal goal of arriving at a consensus.

Many of the justifications posed by students were plausible explanations when specific conditions or examples were given. For example, students believed that Erik Erikson was a cognitive psychologist because the formation of a healthy identity included the ego's cognitive tendency to integrate

childhood identifications. Other students thought that Erikson was a humanistic psychologist because healthy identity formation included issues of self-reflection, self-concept, self-esteem, and mental health. Howard Gardner was thought by some students to be a humanistic psychologist because his multiple intelligence theory adopted a more wholistic or holistic view of intelligence and included the intrapersonal and interpersonal intellectual domains.

The pedagogical lesson here is that listening to students defend or explain their decisions can be an enriching intellectual experience for both students and professors. The forced-choice nature of the teaching and learning task works extremely well as a spark to ignite further discussion and the clarification of subject matter complexities, but less well as a close-ended, right or wrong, end-of-discussion, or graded activity. Clearly, it appears that such a teaching and learning tool needs to be used to facilitate a deeper understanding of the complex nature of ideas in psychology.

The author has recently begun to describe this approach as a "backwards teaching" model. The traditional conceptualization of teaching moves unilaterally in a one-way direction from instruction to the assessment of learning. The findings reported here support the possibility of a more bi-directional loop model where information gathered from assessment tools might also positively influence future instruction as well as evaluation. The

identification of common student misconceptions, misunderstandings, or psychological content resistant to learning and teaching can be used to modify teaching/learning strategies and test items.

Conclusions

The task of asking students to de-construct existing schemata would appear to be rather challenging and yet related to multiple-choice exam performance. Class activities that demand the articulation of similarities and differences between psychological terms, concepts, and theorists should challenge students intellectually, promote the accurate retrieval of knowledge, and improve the transfer of knowledge for understanding behavior. Such instructional tools would appear to be on the "cutting edge" of pedagogical research in psychology and encourage the critical thinking skills needed for more advanced learning in the field.

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Table 1 Common Student Psychological Misunderstandings???

Erik Erikson was labeled a cognitive psychologist (n=13; 30%)
Erik Erikson was labeled a humanistic psychologist (n=10; 23%)
Howard Gardner was labeled a humanistic psychologist (n=11; 25%)
Abraham Maslow was labeled a cognitive psychologist (n=6; 14%)
Abraham Maslow was labeled a behavioristic psychologist (n=5; 11%)
The S—O—R model was associated with the behavioristic view (n=17; 39%)
Erikson's 8 psychosocial stages were associated with cognitive psychology (n=10; 23%)
Defense mechanisms were labeled as part of behavioristic theory (n=7; 16%)
Bernard Weiner's attribution theory was labeled as a behavioristic theory (n=7; 16%)
The Premack principle was labeled as part of cognitive psychology (n=6; 14%)
Erikson's 8 psychosocial stages were labeled as part of humanistic theory (n=6; 14%)
Instrinsic motivation was thought to be related to behavioristic theory (n=6; 14%)
Interactionism was thought to be related to behavioristic theory (n=6; 14%)
Discovery learning was thought to be related to behavioristic theory (n=5; 11%)
The identification process was thought to be related to humanistic theory (n=5; 11%)
Multiple intelligence theory was thought to be related to humanistic theory (n=5; 11%)
Subjectivity was believed to be valued by behaviorism (n=5; 11%)
Environmental (external) forces as explanations of behavior were related to humanistic theory (n=5; 11%)

NOTE: The correct (or more desirable answers) can be found on the Answer Key Grid in Appendix C.

Appendix A

PSYC-350 Educational Psychology
Instructor: Dr. William E. Herman

Instructions: Carefully examine the following list of names, terms, concepts, and ideas included below and place each item in the most appropriate box on the grid sheet provided. Although some items might be included under more than one heading, you should make every effort to place each item under only one heading.

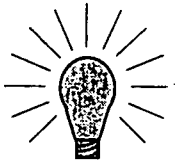
Names of Theorists/Researchers:

Sigmund Freud	Abraham Maslow	Jean Piaget
Carl Rogers	B. F. Skinner	Lawrence Kohlberg
Ivan Pavlov	Erik Erikson	Bernard Weiner
Martin Seligman	Howard Gardner	Albert Bandura
Robert Sternberg	Lee Canter	Jerome Bruner
David Ausubel	Benjamin Bloom	Edward Thorndike
J. P. Guilford	Jerome Kagan	John B. Watson

Important Terms, Concepts, and Ideas:

id, ego, & superego	S---O---R viewpoint
discovery learning	operant conditioning
classical conditioning	wholistic/holistic view
intrinsic motivation	5 psychosexual stages
unconscious motivation	self concept
5 levels of needs	defense mechanisms
8 psychosocial stages	+ & - reinforcement
punishment (2 types)	mental health
extrinsic motivation	S—R psychology
most scientific view	impulsive/reflective
attribution theory	identification
countertransference	environmental forces
reductionistic view	transference
empathy	4 cognitive stages
moral development	hidden factors
Oedipal/Electra crisis	assertive discipline
constructivism	STM, LTM, & chunking
feelings/values	healthy relationships
scientific reasoning valued	symbolic meanings
convergent/divergent thinking	interactionism
values clarification	most clinical viewpoint
multiple intelligence theory	human memory model
objective valued over subjective	importance of personal meaning
subjective valued over objective	6 levels of the Taxonomy
structure of the intellect model	Premack principle
existentialism	intrinsic & extrinsic motivation

DISTINCTIVE VIEWPOINTS IN PSYCHOLOGY



Developed by: William E. Herman, Ph.D.

PSYCHOANALYTIC VIEW	BEHAVIORISTIC VIEW	HUMANISTIC VIEW	COGNITIVE VIEW
NAMES OF PROMINENT THEORISTS	NAMES OF PROMINENT THEORISTS	NAMES OF PROMINENT THEORISTS	NAMES OF PROMINENT THEORISTS
KEY TERMS AND CONCEPTS	KEY TERMS AND CONCEPTS	KEY TERMS AND CONCEPTS	KEY TERMS AND CONCEPTS

DISTINCTIVE VIEWPOINTS IN PSYCHOLOGY

Developed by: William E. Herman, Ph.D

PSYCHOANALYTIC VIEW	BEHAVIORISTIC VIEW	HUMANISTIC VIEW	COGNITIVE VIEW
NAMES OF PROMINENT THEORISTS			
Sigmund Freud Erik Erikson	B. F. Skinner Ivan Pavlov John B. Watson Lee Canter Edward Thorndike	Abraham Maslow Carl R. Rogers	Piaget, Kohlberg, Bloom, Guilford, Kagan, Bruner, Weiner, Sternberg, Ausubel, Gardner, Bandura, Seligman
KEY TERMS AND CONCEPTS			
id, ego, & superego 5 psychosexual stages unconscious motivation defense mechanisms 8 psychosocial stages identification transference countertransference hidden factors Oedipal/Electra crisis symbolic meanings	operant conditioning classical conditioning + & - reinforcement punishment (2 types) extrinsic motivation most scientific view objectivity valued more than subjectivity environmental forces S--R psychology Premack principle reductionistic view assertive discipline	wholistic view intrinsic motivation self concept 5 levels of Needs mental health existentialism empathy healthy relationships clinical viewpoint subjective experience feelings/values personal meaning values clarification	4 cognitive stages moral development intrinsic/extrinsic motivation interactionism constructivism scientific reasoning human memory model STM, LTM, & chunking structure of intellect convergent/divergent thinking multiple intelligences 6 levels of Taxonomy S---O---R viewpoint discovery learning impulsive/reflective attribution theory

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